

**Notice of Allowability**

Application No.

09/802,165

Examiner

Khawar Iqbal

Applicant(s)

CHUN ET AL.

Art Unit

2686

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 2-21-06.
2. ☒ The allowed claim(s) is/are 6,9-24 and 33-35.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some\* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |                                                                                                                     |                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                         | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)                       |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment                                          |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance              |
|                                                                                                                     | 9. <input type="checkbox"/> Other _____.                                                          |

**DETAILED ACTION**

**EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Paul Farrell on 2-21-06.

The application has been amended as follows:

Claims 36-43 have been cancelled.

***Allowable Subject Matter***

2. Claims 6,9-24 and 33-35 are allowed.
3. The following is a statement of reasons for the indication of allowable subject matter: Regarding claim 1 the most relevant prior art of record Kuwahara et al (US 6597678) teaches a base station device in a mobile station where a mobile station receives forward information signals in a plurality of paths according to a communication environment with respect to a forward information signal transmitted from an antenna array having a plurality of antennas in a base station, extracts forward fading information signals for the plurality of paths from the forward information signals, and transmits a reverse signal including the forward fading information signals to the base station, the base station device comprising; a receiver for receiving the reverse signal

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through the antenna array, processing the reverse signal received through the antenna array, and extracting forward fading information from the received reverse signal; a beam formation controller for generating weight vectors to be assigned to the antennas of the antenna array based on forward fading powers and array vectors indicating direction of a forward signal estimated from the received reverse signal for the plurality of paths, so that the intensity of a transmission beam pattern steered from the antennas in a direction to the mobile station is large; and a transmission beam generator for applying the weight vectors to the antennas; a reverse processor for processing a reverse signal received through the antenna array; a forward fading information extraction unit for extracting forward fading information from the received reverse signal; a beam formation controller for generating a weight vector for formation of a transmission beam using the forward fading information and the received reverse signal; and a forward processor having a transmission beam generator for generating a transmission beam for a transmission message based on the weight vector and a forward fading decoder for decoding forward fading information for each path fed back from a mobile station from the received reverse signal of the reverse processor; and a forward fading extractor for extracting a forward fading coefficient from the decoded forward fading information; herein if the decoded forward fading information is represented as quantitative information the forward fading extractor extracts a forward fading severity using a weight vector  $w$  and an estimated array vector used for formation of the transmission beam. Claims 6,9-24 and 33-35 are allowable over the prior art of record since the cited references taken individually or in combination (in view of

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Applicant Remarks/in the amendment) fails to teach wherein if decoded forward fading information is represented as complex information  $\{\beta_{i-1, 2, \dots, M}\}$ , the forward fading extractor extracts a complex forward fading coefficient  $\{F_{i-1, 2, \dots, M}\}$  using a weight vector  $w$  and an estimated array vector  $\{a_{i-1, 2, \dots, M}\}$  used for formation of the transmission beam., in combination with other the limitations of claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should clearly be labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Khawar Iqbal whose telephone number is (571) 272-7909.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Marsha D. Banks-Harold can be reached on (571) 272-7905. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status

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information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

*Khawar Iqbal*

  
CHARLES APPIAH  
PRIMARY EXAMINER